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ABSTRACT

The controversy over the use of standardized tests with minority-group children has generally ignored the issue of examiner race and sex factors on test performance. This study investigated the effects of the race and sex of a test examiner and the anxiety level of the subjects and their achievement test performance. Examiners (E) of different races and sex administered an anxiety questionnaire and two achievement measures to a total of 268 black school children in 24 different fifth- and sixth-grade classrooms. The subjects and examiners were manipulated to form a randomized 2x2x2x3 factorial design. The main effects of subject (S) anxiety and E sex were found to be statistically significant in diminishing the performance of the subjects. Interpreted within a learning theory model, these results suggested that Ss had learned to expect negative consequences from group-testing situations and subsequently performed more poorly. On the average, Ss performed significantly lower with female Es than with male Es. (Author)

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Examiner Sex, Examiner Race and Anxiety Effects On the Testing of Black School Children

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In his review of the literature over the controversial use of standardized tests with minority-group youngsters during the past five decades, Gronbach (1975) reported little research on the influence of examiner characteristics. Studies which were done in this area furthermore appeared to be contradictory.

Recent reviews of the literature (Sattler, 1970; Shuey, 1966) of examiner race factors have indicated little evidence to support the contention that examiner race is a factor in the testing of minority-group subjects. Sattler (1970) commented further on the inconsistency of the results and the general paucity of studies adding that little is actually known about the effects of examiner race on group-administered tests.

Meanwhile, studies done by Katz, Epps and Axelson (1964), Katz and Greenbaum (1963), and Pelosi (1969) have indicated that the race and sex of the examiner were significant factors in the testing of minority-group subjects. In his research, Katz has suggested that the presence of a white examiner tended to raise the level of felt anxiety by the subjects and, therefore, affected their performance.

Further investigation by Katz, Roberts and Robinson (1965) suggested that the relationship between anxiety, examiner race and achievement was curvilinear. At moderate levels, this heightened sense of anxiety was motivating while at higher levels, it proved to be overwhelming and diminished performance.

Research into other dynamics suggested that male subjects appeared to respond better with female examiners while female subjects performed at a higher level with males (Stevenson, 1961; Stevenson and Allen, 1964). The hypothesis presented to account for this relationship was couched, however, by the dynamic issue of male and female roles in our society.

Throughout these inquiries little research was conducted using children. Instead, the subjects tended to be college students (Katz, Epps and Axelson, 1968; Katz and Greenbaum, 1964; Katz, Roberts and Robinson, 1965) or young adults (Pelosi, 1969).

Methodologically, as well, most of these investigations were weakened from a lack of an effective anxiety measure, a limited number of examiners of each race or sex, and/or the failure to include subjects of both sex.

The literature concerning the influence of examiner effects upon the performance of black children, therefore, revealed only piecemeal evidence. No study had employed all of the simultaneous components of more than one examiner of each race and sex, considered both male and female subjects, employed an anxiety measure and concerned itself with children.

The purpose of this study, therefore, was to investigate the affects of examiner sex and race and their interaction effect with subject sex and anxiety upon achievement test scores resulting from a group administration.

METHODOLOGY

Twenty-four fifth- and sixth-grade classrooms were selected randomly from four different elementary schools in a working-class school district in the Midwest which had been integrated the past year under court order. This sample procedure generated an N of 268 subjects (133 males, 135 females).

The N of 268 represented 47 percent of the total enrollment of the twenty-four classrooms used in the study and thus was significantly higher than the district-wide fifth- and sixth-grade enrollment figure of 39 percent. The fact that this study involved roughly 22 percent of the black children in the fifth- and sixth-grades was partly by design. The four schools employed in the study came from an original group of six who volunteered to participate. Selection was then made on the appropriateness of the population and the percentage of black enrollment.

Twelve examiners (three black males, three white males, three black females and three white females) were selected by interview from a number of volunteers from the school system and trained in the administration of the instruments. Each was then assigned to two separate classrooms on a random basis.

On separate mornings, the examiners arrived at their assigned schools and introduced themselves to their group. Each examiner then proceeded to administer the Test Anxiety Scale for Children (TASC), (Sarason, et al., 1958) and the Reading Comprehension and Arithmetic Computation subtests of the Comprehensive Tests of Basic Skills (CTBS), (McGraw-Hill, 1968).

Instruments

The TASC, developed by Sarason and his associates, includes thirty questions primarily related to anxious behavior during the testing situation. The questions are read aloud to the subjects, and they are asked to circle either "yes" or "no" in response to their own feelings regarding the statement.

Most research with this instrument has supported Sarason's contention that the concept of test anxiety, as measured by the TASC, is negatively correlated with I.Q. and achievement test scores (Sarason, et al., 1960; Zeibelson, 1956) although the correlations are inconsistent and unstable.

The CTBS, level two (McGraw-Hill, 1968) is a well-established instrument for measuring achievement. The Reading Comprehension subtest contains forty-five items which require thirty-eight minutes to administer. The test contains stories, letters and poems of increasing length and difficulty. The Arithmetic Computation subtest consists of forty-eight items which require forty minutes to administer. The subject is required to work out problems in fractions percentages and decimals. Scrap paper is provided.

Numerous critics have praised the care and attention given to the standardization and development of the instrument (Ahmann, 1970; Brown, 1970). The validity and reliability determinants follow closely the 1966 APA recommendations for psychological tests.

The CTBS and TASC tests were placed into coded envelopes and collected by the investigator. The TASC scores of the Ss were grouped and separated into quartiles; Q4 representing the High Test Anxious (HTA) and Q1, the Low Test Anxious (LTA) parameters, respectively. The remaining scores (Q2 and Q3) were grouped into a generic Middle Test Anxious (MTA) classification. Thus, subject test anxiety was used as an independent classification factor with three levels.

Examiner race (black/white) and sex (male/female) and subject sex (male/female) were the other independent variables with two levels each. CTBS Arithmetic and Reading Test Scores and their sum scores were the dependent variables. The design was analyzed by a 2x2x2x3 analysis of variance (Edwards, 1967).

The following hypotheses were investigated: (a) HTA Ss, regardless of their sex, would score significantly lower on the CTBS than the LTA Ss; (b) male Ss, regardless of their level of anxiety, would score higher on the CTBS with female Es than male Es; (c) female Ss would score significantly higher with male Es than with female Es; and (d) Ss, regardless of their sex, would score higher with black Es. The two tailed .05 level of significance was used for accepting or rejecting these hypotheses.

RESULTS

Anxiety

As Table I indicates, the main effect of anxiety was found to be statistically significant at the $p < .002$ level. As shown in the summary table, Anxiety was found to be a greater factor on the Ss performance on the Arithmetic ($p < .006$) subtest than on the Reading Comprehension ($p < .02$).

TABLE 1

ANALYSIS OF VARIANCE OF EXAMINER RACE AND SEX AND SUBJECT SEX AND LEVEL OF ANXIETY

Factor	df	CTBS Reading	CTBS Arithmetic	CTBS Sum
Anxiety (A)	2	.02*	.006*	.002*
S Sex (B)	1	.0001*	.0001*	.0001*
E Sex (C)	1	.12	.03*	.04*
E Race (D)	2	.77	.08	.90
A x B	2	.33	.57	.48
A x C	2	.24	.53	.24
A x D	2	.98	.77	.85
B x C	1	.45	.46	.39
B x D	1	.22	.13	.10
C x D	1	.94	.98	.99
A x B x C	2	.69	.99	.89
A x B x D	2	.07	.06	.02*
A x C x D	2	.57	.54	.95
B x C x D	1	.61	.67	.92
A x B x C x D	2	.27	.76	.87

*Within acceptably significant limits

The above findings indicated that black children, regardless of their sex or the race or sex of the examiner, were significantly effected by their expressed level of test anxiety. While this finding tended to support previous studies, the degree to which anxiety was a factor with black Ss had not always been investigated. This result, therefore, suggested that the over-all effect of test anxiety found for white children (Sarason, et al., 1960) can be generalized to black children.

However, the effects were not curvilinear as had been previously reported. Rather Table II shows a linear and negative relationship between anxiety and performance.

TABLE II

CORRELATIONS BETWEEN TASC AND CTBS SCORES

	CTBS			
Subjects	Reading	Arithmetic	Sum Scores	P
Boys	-.32	-.32	-.37	.001
Girls	-.21	-.20	-.22	.005
Total	-.19	-.18	-.21	.002

While these results were consistent with previous findings of Sarason, et al. (1960) in studies done primarily with white, middle-class children, these correlations are low and account for less than ten percent of the total variance.

An additional finding of the investigation was that after quartiles were calculated for the total sample, a. X^2 on the number of Ss in the HTA, LTA, Male and Female categories revealed a significant ($\bar{p} < .005$) number of girls fell into the HTA category and boys into the LTA category.

TABLE III

DISTRIBUTION OF HTA AND LTA SUBJECTS BY SEX

Subjects	HTA	LTA
Boys	30	44
Girls	55	30

This supports previous findings (Sarason, et al., 1960) that girls tended to express higher levels of anxiety on the TASC.

The interaction effect, furthermore, of E race and S anxiety did not prove to be statistically significant ($p < .85$). This finding suggested that children reporting different levels of anxiety were not affected differently by Es of different races.

Examiner Sex

The main effect of E sex was found to be statistically significant ($p < .04$) but not in the hypothesized direction. As Table IV indicates, the mean CTBS scores of the subjects, regardless of sex or level of anxiety, were higher with male examiners.

TABLE IV

CTBS SCORES OF BOY AND GIRL SUBJECTS WITH MALE AND FEMALE EXAMINERS

Ss	Es	CTBS Reading Mean	Reading SD	Arithmetic Mean	Arithmetic SD	Sum Scores Mean	Sum Scores SD
Boys	Males	39.22	6.64	40.90	7.54	80.12	11.90
	Females	39.30	7.99	39.79	7.34	79.58	13.75
Girls	Males	43.81	7.22	45.75	6.72	89.42	12.14
	Females	42.21	7.42	43.92	8.47	86.14	14.52

Furthermore, while the interaction effect of S anxiety and E sex was not found to be significant, inspection of the mean score indicate that HTA Ss performed better, on the average, with male Es and LTA Ss with female Es.

Examiner Race

The main effect of examiner race was not found to be a statistically significant factor in the test performance of the Ss. Furthermore, none of the interaction effects of E race under investigation proved to be significant or enlightening.

These findings were consistent with recent reviews of the literature (Sattler, 1970; Shuey, 1966) which suggested little, if any, evidence to indicate that the race of the E affected the test performance of black Ss.

Subject Sex

The main effect of S sex (Table I) was found to be a statistically significant ($p < .0001$) influence on S achievement. This suggests that the male and female population of the study was representative of two somewhat distinct samples and argues for a more careful interpretation of studies done on heterogeneous black school-age populations.

DISCUSSION

It is apparent from this study that anxiety exerted a significant influence on the test performance of black children. The degree and depth of anxiety's effect, however, is an issue open for further investigation. While discussion of the relevance of standardized tests for minority group subjects is perhaps a crucial issue in this discussion, it was beyond the scope of the present investigation. Suffice it to say that whatever the degree of validity, it appears that black, working-class children view a group test-taking experience with as much apparent anxiety as white, middle-class children.

Likewise, it was apparent that the presence of a female in the classroom was a significantly diminishing factor in the test performance of these children. Theoretically, it would appear that as anxiety had become a learned reaction to the testing situation of these children so too had the presence of a female authority figure come to be associated with negative consequences.

It can be surmised that, since the overall achievement test scores of the children in this sample were below the national norms, many of the children had experienced a good deal of frustration in school. It can be further surmised that they had learned to expect aversive or, at best, non-positive consequences when faced with an evaluative, academic task. Within a learning theory model, it can be suggested that since it was a female who generally was the dispensor of both rewards and punishments, the negative consequences of the test-taking experience may, therefore, have become associated with female figures.

Although Sarason's (et al., 1960) theory on the formation of test anxiety was primarily supported by his research with white, middle-class children, it, nevertheless, stressed the importance of the relationships between adult authority and achievement in shaping attitudes during the pre-school years.

Perhaps the fact that one-fourth of the children in the study came from homes where a female was head of the household compounded the results of this investigation.

Examiner race was a non-significant influence on the children's achievement. The effect of examiner race, therefore, may have been occluded by the greater effects of anxiety and examiner sex.

The lack of effects of examiner race likewise may have been due to the children's exposure to an integrated school staff. Within the twenty-four classrooms, for example, the racial and sexual breakdown of the homeroom teachers was: white female, 8; white male, 7; black female, 5; black male, 4.

Thus, nine out of the twenty-four teachers were black (37 percent) and eleven (47 percent) were male.

While the percentage of black teachers throughout the school system tended to remain constant at each grade level, male teachers below the fourth grade were rare. Were a similar approach taken toward the employment of male teachers in lower grades, perhaps the issue of examiner sex would no longer be relevant.

CONCLUSION

While it appears that this investigation has raised more questions than it had attempted to answer, certain elements appear to be clear. First, anxiety is as significant a factor in the test performance of black children as white children. In addition, increased test anxiety was negatively correlated with achievement. Second, the sex of the examiner does appear to have some effect on the performance of black, working-class children even in a group-administered test. Finally, examiner race was not a significant factor. This result may have been a consequence of an effective policy of recruitment and deployment of black teachers.

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